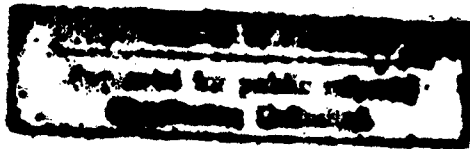


JPRS-WST-84-014

4 May 1984



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West Europe Report

SCIENCE AND TECHNOLOGY

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WEST EUROPE REPORT

SCIENCE AND TECHNOLOGY

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ADVANCED MATERIALS

NEW MATERIAL, PROCESS SPINS OFF FROM VOLVO LCP 2000 PROGRAM

Helsingborg PLASTFORUM SCANDINAVIA in Swedish No 1/2, 1984 pp 46-47

[Article: "Wet Hot-Molding--a Spinoff From Volvo/Jotun"]

[Text] It will be a long time before the reaction to Volvo LCP has calmed down. An interdisciplinary project of that caliber naturally gives rise to a great many spinoffs. One of these will reverberate in the world of plastic! We are thinking of Volvo/Jotun's improved method of wet hot-molding, which will be of tremendous interest to the reinforced plastics industry and its customers.

Wet hot-molding is not entirely new as a method, but the project group from Jotun and Volvo succeeded in making such improvements that it will become highly interesting to everyone who wants to have reinforced plastic with extremely high surface finish.

Before the Light Component Project, LCP, in which Volvo wanted to study the coming requirements and challenges of the automobile industry of the future, Volvo gathered an international group of experts for the development work. Included in the group was Jotun, among others, which was given the task of working with the car's exterior. Roof, engine hood, doors and body panels were of course to be manufactured from lightweight metal, glass fiber plastic, but Volvo's requirements for surface finish and production economy were not to be altered. This led to very extensive work, and when the whole thing was over the result was both a new construction material and a new production method.

Volvo and Jotun formed a project group for the exterior, for which the starting-point was the following conditions by the client: low weight, 2 mm maximum thickness, dimensional stability up to + 80° C, class A finish after painting, easily painted and repaired, optimum rigidity and strength, good impact resistance, good resistance to chemicals, self-extinguishing properties and no toxic fumes in a gasoline fire.

The following work program was established:

1. Material and method studies for development of prototype cars.

2. Continued development of the SMC [sheet molding compound] technique for large-scale series production.
3. Development of a new technique for series production of flat body details.

New Reinforced Plastic Material

Volvo's demands for both extreme surface finish and good impact properties required a great deal of development input by Jotun. High surface finish means, among other things, extremely little shrinkage in the polyester. A new type of low-profile polyester, with less shrinkage than anyone had ever been able to produce before, had to be developed. This was achieved by means of newly developed low-profile additives (thermoplastics and elastics) as well as with shrink-inhibiting fillers (calcium carbonate, aluminum trihydrate and microspheres).

Altogether about 60 different prescriptions were tested before the finished, new quality for Volvo LCP 2000 was established.

New Production Method

The next step was to find a suitable production method. The project group was not satisfied with the conventional SMC technique (SMC = sheet molding compound; polyester-impregnated glass fiber mats, cut to appropriate size and placed in the molding tool before compression molding). The opinion was that SMC, with its semifinished production and curing process necessary before molding and the expansion in strength properties as well as its tendency toward long- and short-wave behavior in goods molded into thin sheets, was something one wanted to get away from.

Wet Hot-Molding

One decided on the wet hot-molding method, which by no means is new, but which was freshened up by the project group into something which will have major application.

The difference between SMC and earlier wet hot-molding is to some extent that the glass fiber reinforcement is preformed and 100 % adjusted to the mold space. This is possible by means of a continuous glass fiber mat, newly developed by Vetrotex, with a thermoplastic binding agent. This binder enables preforming in a completely new way.

The advantages with this method is that the placement and distribution of the glass fiber reinforcement in the molded product can be predetermined.

The polyester mixture can be placed in batches on the preform of the mold and thus will not be preheated before the halves of the tool close. This opens up great opportunities for rapid curing systems and therefore short cycle times.

This method provides the same opportunity for IMC (in mold coating) as with SMC molding if dyeing is needed or if there is an antistatic surface.

When molding thin panels of light plastic sheet molding compound, a formation of long and short waves often occurs on large, flat surfaces. This is caused by flow tendencies and uneven glass fiber distribution, which together with pores are major problems.

All of this is overcome with wet hot-molding in the technique now worked out by Jotun which produces panels that meet Volvo's demands. The participants in the "New Techniques" conference in Sandefjord were able to witness this with their own eyes just before Christmas 1983, and those who were present at one of Volvo's presentations of the LCP cars also agree.

Besides short cycle times, this method is also said to require lower investments than the SMC technique.

In all likelihood it will not be long before we can see the next product manufactured with this method.

		Ordinary light plastic SMC	New method
Strength in bending	N/mm ²	169	155
E-module bending	N/mm ²	13,230	8,190
Stretching ϵ /max load in bending	%	2.0	2.8
Yield strength	N/mm ²	84	84
Glass fiber content	Weight %	27	25
Density	g/cm ³	1.9	1.76

Mechanical properties of the new wet hot-molding material in comparison with a low-profile SMC.

11949

CSO: 3698/341

AUTOMOBILE INDUSTRY

PEUGEOT PRESIDENT ON 1984 OUTLOOK, FUTURE OF TALBOT

Paris L'ARGUS DE L'AUTOMOBILE in French 2 Feb 84 p 11

[Article by J.-P. Jagu-Roche]

[Text] Despite some misadventures, PSA continues to hold its position better than was expected, and its total market penetration of 32.3 percent for 1983, remains close to the forecasted level.

Thanks to the BX, Citroen has seen its sales increase by 4.1 percent, and Peugeot itself had sold 110,000 205's by the end of January, for a cumulated sector penetration of 5.2 percent. And now here comes the 205 GTI, the top model in a successful line, the rejuvenated product, the result of strict management, all of them harbingers tending to prove that the group's financial equilibrium could well be restored in 1984.

Some questions however still remain about market evolution, government price policy, or the future of the Talbot name. These were the topics discussed last Monday, in Spain, during the press presentation of the 205 GTI by Jean Boillot, vice-president of Automobiles Peugeot, and Jacques Calvet, president of the lion and chevrons company [Peugeot and Citroen]: The men at the top.

First of all, a few words about the newcomer. After the gasoline and diesel versions, the manufacturer is strongly pushing ahead with further variations on the sacred number, by introducing this sports model aimed for a position at the top of the line, in a field which until now has been reserved by others. Moreover, the GTI, of which 15,000 to 17,000 should be sold in France by the end of December (to represent at that time 10 percent of the 205 sales), is more than a simple novelty. It is also proof of an evident desire to stand at the top level of automotive technology, an optimistic challenge, and a car offered at only 67,600 francs, which should fortify it against the potential competition of Golf 2 GTI, Fiat Ritmo 2, and Ford Escort XR 3i. But one model alone does not make a line, nor does it create the success of a name.

It should be noted that in general, the overall results of Automobiles Peugeot are relatively satisfactory for the past year. As Mr Baillot indicated, "we have made rather good progress in 1983, gaining 1.4 points in penetration,

thanks to a clear advance in Peugeot sales, and despite a regression in those of Talbot. In addition, our European registrations have also started to show a positive evolution in the fall." To which he added that "this balance sheet does not solely reflect the good health of the 205, but that of the 305 and 505 as well."

Recovery

As for the group itself, keeping in mind the economic crisis, its financial losses should be less than 2 billion francs for 1983; the recent social troubles at the Talbot plant in Poissy have certainly not helped matters.

But the net investments planned for this year remain high, at 4 billion francs (of which 500 million allocated by FIM--Industrial Funds for Modernization), while PSA's debt represents only 4 percent of its overall revenue (compensated by the reduction in interest rates).

But Mr Calvet is quite determined to upgrade the personnel and production tooling used by the holding company's units (thus assuring for the French automobile industry an overemployment equal to 10 percent of its personnel).

The chief executive, who retains the support of the banks and the stock market, restated his intention to carry out a very strict management, and to deinvest if need be, while maintaining the product's future at all costs.

This strategy seems to have borne fruit, since "1983 will have seen the beginning of the group's financial recovery, and our account sheet should be balanced in 1984." A statement accompanied by reservations regarding our country's economic and political evolution.

Commercial Results

What were the sales results for 1983, and what will they be in 1984?

Mr Calvet answers: "One year ago, we hoped to achieve a total penetration of 33 percent in a market which we then estimated at 1.9 million new cars, and which has now exceeded 2 million vehicles. We therefore managed to achieve a sales volume slightly higher than our objective with a penetration which, it is true, was slightly lower than predicted. The 1984 market will be weaker, but given our new products and the success of the BX, we should at least do as well as in 1983, with a lower total sales volume. However, our results will also depend on the tariff policy of foreign manufacturers, and on the prices which we ourselves will be able to use. In this respect, I wish that the present control system would be abandoned soon, and that prices were allowed to be free. Because for the time being, manufacturers have no flexibility in this area, a situation that penalizes them when they introduce a new model, for instance. The freeze places us in a situation which leaves no room for adjustment between cost and selling prices; in addition, we should nevertheless make a constant effort to keep our salaries in check, a thing which is not easy to do. In two years, our costs have increased by 18 percent and our salaries by 34 percent."

But beyond these financial considerations, Messrs Calvet and Boillot also agree that PSA's upcoming balance sheets also depend on the health of its two sales networks, and while one is in good health--the BX has lent some brilliance to the Citroen brand name--the other has a negative profit margin of 0.45 percent.

That is because French dealers have experienced no sales growth during recent years, but in exchange have seen their costs steadily increase while after-sale hourly manpower rates were becoming the lowest in Europe.

Matters should nevertheless improve, since the product is being delivered and since the group's leaders have gone to plead the case of hourly rates with a director general of the competition, who listened and was quite interested in raising them. All of which deserves some applause.

And Talbot?

Asked at the conference about Talbot's future, the Automobiles Peugeot officials took positions that were already known: they stated that the Poissy industrial site would be kept active, since it just received an investment of 1.2 billion francs devoted to its modernization and installation of the structures needed to produce the future middle of the line model, which for the time being is called the C28, and which will carry the Talbot brand.

But is it certain that the Talbot brand will be maintained as such? Mr Boillot responds that, "we have said and we repeat that we firmly intend to keep the two brands. They will of course integrate models whose components will be similar. The Samba and the 104 Z have the same engine-transmission package. You would therefore be wrong in drawing an overly hasty conclusion from what has been occurring for the last six months."

Talbot thus remains Talbot because there are markets, such as Spain, on which the name has a penetration of 8-9 percent, compared to 2.5 percent for Peugeot. And also in order to stabilize a public which is undoubtedly worried.

What about the future? "Ultimately, our customers will be the judges," they say at PSA, which makes us wonder. The matter seems to be closed however, at least for the time being!

On the other hand one thing is certain: there is no question of involving Citroen. "That is a company," says Mr Calvet, "which has its brand, its network, and which will remain totally independent."

What Outlook?

This completes our overview. The coming year should be favorable to the Peugeot group, which with initiative and an enterprising spirit, wants to remain private above all.

By way of conclusion, here is a statement from Mr Calvet about the problems currently being suffered by our automobile industry:

"We will no longer be able to support this type of strikes. Otherwise there will no longer be an automobile industry in a few years. The efforts which this industrial sector will have to make to survive in the future are not very well appreciated today." A word to the wise.

11,023

CSO: 3698/323

AUTOMOBILE INDUSTRY

PEUGEOT FORMULATES STRATEGIES TO BECOME PROFITABLE AGAIN

Paris L'USINE NOUVELLE in French 16 Feb 84 pp 40-44

[Report comprised of several articles, each by a different author; this translation consists of an excerpt of one and the text of another]

[Text of article by Jacques Barraux] [Overview]

Can Peugeot survive? Since mid-1981, the French private sector's leading industrial group has been struggling to climb out of the red. Four years of huge operating losses have sapped its vitality.. Massive indebtedness, insufficient funds of its own: The firm is weakened, while everywhere else in the world the automobile makers have recovered the offensive. General Motors has reported a 1983 net profit of 32 billion francs. Ford has overtaken the state-controlled Renault company in sales in Europe. The Japanese are penetrating every market whose door has been left ajar. For Jean-Paul Parayre and Jacques Calvet, the alternatives are simple: Peugeot must either adapt to the new rules of competitiveness in the world market beginning in 1984 or the group will become the hostage of its bankers and creditors--that is, of the state--and be dragged to the downslope of decline.

The rampant nationalization of Peugeot would not produce the effect being taken for granted by the CGT [General Confederation of Labor]. It would complicate matters--which are already difficult--for the Renault company. It would translate, at least transitionally, into a cutback in activity and hence a growing pressure on employment.

A considerable job of tidying up has already been done within the PSA [Peugeot Corporation] group. After Talbot, Citroen is now the number one in regard to labor unrest. The head office on Avenue de la Grande-Armee in Paris would be glad to do without this adverse publicity. But how can it hope to escape fading into oblivion?

It can design new products, revitalize its sales force, improve the quality of its models: Peugeot has at its disposal a large reservoir of talent with which to resolve all the problems stemming from the hardening of competition. There are two fundamental obstacles, however, that it must surmount.

The first concerns its social model. The group's top management is now according full weight to the need to bring calm and a businesslike management approach to labor relations within the group. PSA is the sum of three different enterprises, three traditions, three cultures. A synthesis of all these ingredients must now be brought about and a unitary model invented. This essential task has been assigned to Jean-Marie Nathan-Hudson.

The second obstacle to be overcome concerns the general management of the enterprise. Who is in charge at Peugeot? No one knows for sure whether it is the family itself--which has courageously continued to fully assume the business risks--or the board of directors or the company's operating subsidiaries. The irresistible rise of Jacques Calvet, now the direct owner of Peugeot-Talbot and of Citroen, has not simplified the organization chart. The exact division of functions and responsibilities between him and Jacques Parayre, chairman of the board of directors of PSA, has yet to be defined. The operating efficiency of the management structure linking the head office, the company's divisions and its services has also yet to be demonstrated. Who is responsible for what? How are decisions carried out? Who defines objectives? Who penalizes mistakes?

Peugeot is fighting to keep its identity. This, however, does not justify keeping notoriously unsuitable management structures. The rescue of PSA will require not only the elimination of its overstaffing and the robotization of its plants: It will depend also on a clearly and fully defined distribution of functions and responsibilities at the summit of the group.

[Excerpt of article by Georges Le Gall: "Industrial Goal: Recover Profitability to Invest More"]:

The management of PSA [Peugeot Corporation] had set two objectives for 1983: Increase its market shares after the uninterrupted slump it had endured since 1979; bring the group out of the red in which it had been mired since 1980. The first of these objectives was partially attained; the second, not at all.

Last year, its total production of private cars and small commercial vehicles in France, Spain and Great Britain was 1.66 million units, around 3 percent higher than in 1982. On the French market for private cars, which, all makes combined, slipped 1.9 percent, from 2,056,000 units to 2,018,000, PSA vehicle registrations rose from 622,000 to 650,000 (+4.5 percent) and its share of the market from 30.2 percent to 32.2 percent. Results achieved by the group's three makes, however, varied widely: 301,000 sales for Peugeot (+15.3 percent), 259,000 for Citroen (+4.1 percent), but 90,000 for Talbot (-19.5 percent).

There is nothing mysterious about these declines: Peugeot had the winning card of its 205 and Citroen that of its BX*, while Talbot introduced no new

*In 1983, the BX already represented one-third of Citroen's production of private vehicles.

model. Taking the West European market as a whole, where the Marketing of the 205 and of the BX followed a gradual rise, PSA stabilized its sales at an absolute value of 1.22 million vehicles; but since total registrations rose 5 percent to 10.4 million, PSA's market share continued to slide, from 12.4 percent in 1982 to 11.7 percent in 1983. Here again, performances varied: Peugeot up from 410,000 to 453,000, Citroen only slightly down from 505,000 to 499,000, and Talbot plunging from 319,000 to 272,000.

Unfortunately, this very mild marketing comeback was not accompanied by the hoped-for financial rebound. PSA's accounts for 1983 have as yet not been released. However, it is certain that its losses will be substantial, probably attaining a level close to that of 1982 (2,148 million francs). The spread between selling prices (price increases authorized by the Government totaled 18 percent for all of 1982 and 1983) and cost prices (during the same period, wage and salary charges rose 34 percent; in 1983, owing mainly to the rise in prices of raw materials--steel, aluminum, plastics, rubber, etc--procurement costs rose by 10 percent); insufficient productivity owing to overstaffing (well over 2,000 jobs were eliminated during the second half of 1983) and to a shortage of technical personnel: This is how Jacques Calvet --the former president of BNP [National Bank of Paris] who, having come to PSA in October 1983, has taken on the functions of CEO [chief executive officer] of Automobiles Peugeot and Automobiles Citroen--explains the continuation of last year's losses. Disappointed by 1983 results, Jacques Calvet is being cautious. This year, he thinks PSA's market share in France will be 33 percent, but of a recessionary total private-car market estimated at 1.85 million vehicles (-8.5 percent). PSA's sales in the other European countries are expected to rise. Overall, the group's total volume of production will be about the same as in 1983. And its accounts "should" be brought into balance, provided, however, certain conditions prevail, which Jacques Calvet is underlining, namely, narrowing of the inflation gap with respect to Germany so that the French automobile industry will not continue losing competitiveness; and absence of social conflicts that could arise with the cutting back of jobs at Citroen.

What is abundantly clear at this point in time is that PSA's cumulative losses between 1980 and 1983 totaled around 8 billion francs. In 1979, it had reserve funds of its own totaling 13.6 billion francs and long-term debt totaling 8.6 billion francs. Its situation having deteriorated without letup since then, its 1982 accounts show a drop in reserves to 8.2 billion francs, a rise in long-term debt to 13.8 billion francs, and financial charges running 3.4 billion francs. 1983 results will only cast a further pall over this situation, with reserves probably falling to around 6 billion, long-term debt exceeding 15 billion, and rising financing charges.

PSA, a privately owned group, has as its principal bankers state-owned or -controlled credit institutes: BNP, Credit Lyonnais, Paribas, Societe Generale. The alert level was reached long ago: PSA cannot be allowed to end up 1984 with similarly bad financial results for the fifth consecutive year. Otherwise (absent Government intervention), the banks will be compelled to cut back on their cooperation and PSA will find itself compelled to cut back on its expenditures, including its investments.

Inevitable Job Cutbacks

Painful though it will be, PSA's financial restructuring will require a slashing of jobs. From 1978 (272,000 employees) to 1983 (202,000) the drop has assuredly been spectacular: 26 percent. It still less, however, than the drop in production: From 2.5 to 1.66 million vehicles (-34 percent).

What PSA is planning to do now is to increase its productivity at a constant or slightly rising level of production, instead of allowing a lag time, as heretofore, for the evolution of its staffing to catch up with its declining volume of activity.

A recovery of profitability to enable it to invest more and thus improve its ability to introduce new models: This is PSA's central problem. True, the group has invested in and has even built new plants designed to produce components common to Peugeot, Talbot and Citroen: Identity of engines began in 1979 at Tremery (near Metz) and of transmissions in 1981 at Valenciennes. To catapult Peugeot (whose production at the time totaled no more than 731,000 vehicles) into a position among the world's big auto makers: This was the objective sought in 1974 when the company took over the management of Citroen and in 1976 when it became its owner (giving birth to the PSA, whose production totaled 1.5 million vehicles), then pursued this policy with the purchase of the European subsidiaries (France, Great Britain, Spain) of Chrysler in 1978, attaining for PSA a production of 2.5 million vehicles.

Success would have required the immediate transformation of the Peugeot-Citroen-Chrysler conglomerate into a homogeneous group benefiting from economies of scale based on commonality of organizational components. Delays lengthened and will continue to lengthen, Jean-Paul Parayre, chairman of the board of directors of PSA, having declared on December 1983 that the rationalization of the group will take another 5 years.

Things should have gone much faster. This is easy to say. So be it. But the figures hand down a verdict that is hard to contradict. For, it is certainly not reasonable to think that, when PSA's top management bought out Chrysler's European subsidiaries, it expected PSA's share of the private-car market to plunge, between 1978 and 1983, from 45.9 percent to 32.2 percent in France and from 17.7 percent to 11.7 percent in Western Europe as a whole. The fact is that Chrysler contributed nothing to PSA; since, in 1978, Peugeot and Citroen by themselves had 35.2 percent of the French market and 11.8 percent of the European one, that is, a bigger share of these than with Talbot in 1983!

The integration of Chrysler Europe into PSA was a setback. It provided no additional marketing outlets and only generated deficits. Initially, the objective was that Peugeot, Citroen and Chrysler Europe (which became Talbot in 1979) were to remain on an equal footing with each other: Common organizational structures, but each one operating autonomously, having its own product line and its own network. In 1980, this changed: Peugeot absorbed

Talbot, decided to have a joint product line, and merged the networks. The legacy of past hopes: The top-of-the-line "Tagora," introduced in 1981, went out of production in 1983 for lack of customers; and Talbot's Formula-One presence turned out to be a flash in the pan. In a new 1983 year-end move, Peugeot decided to cede its shares in the Talbot partnership venture to two small companies of the PSA group so that Peugeot would not have to file a petition for bankruptcy in the event Talbot's situation worsened.

Mired in its losses, PSA has been unable to renew its models. At Peugeot, the 104 dates back to 1972, the 305 to 1977, and the 505 to 1979. At Citroen, the 2 CV dates back to 1949, the GS to 1970, the CX to 1974, the LN to 1976, and the Visa to 1978. At Talbot, the Horizon dates back to 1978, the Solara to 1979, and the Samba to 1981. True, some of these vehicles have been supplemented by additional versions: Diesel, turbo, etc. But this has not sufficed to stem PSA's fall-off in sales, while West European markets, in which the group makes 85 percent of its sales, have been good, having matched again in 1983 their record level of 1979. In the absence of new lines, Peugeot's and Citroen's sales have fallen off as have Talbot's.

Recent Vehicle Models "Cannibalize" Older Ones

The fact is that the only two models attesting the integration of the group (in that their supporting structures are to be used for all the vehicles of middle and low end of the Peugeot-Talbot-Citroen line) are the BX and the 205, marketed in October 1982 and February 1983. These two vehicles have been a success. In 1983, the BX accounted for one-third of Citroen's private-car production; it is presently being produced at the rate of 1,100 vehicles (1,000 at Rennes, 100 in Spain) daily. Production of the 205 should attain 1,650 units daily in July (1,050 at Mulhouse, 300 at Poissy, 300 in Spain). Eleven versions of the latter model have been introduced over a period of 1 year, the last of which, the GTi sport version, can do 190 km/hr. Two models, however, do not make a line. And the recent cars "cannibalize" the older ones: In 1983, Peugeot sold 106,000 of its 205's in France, but its sales of the 104 fell from 91,000 to 40,000; Citroen sold 91,000 BX's, but its sales of the GS fell from 56,000 to 29,000.

The introduction of new lines is an absolute must today to avoid losing market share.

If its troubles persist, will PSA be forced to concentrate on middle and top of the line models and forgo replacement of its smaller vehicles, like the 204 and the 2 CV? In any case, the decision to produce the small engine designed jointly with Fiat has not yet been made. Even if its financial situation is put back in order, it cannot hope to do much better than the other big competitors: 12 to 13 percent of the West European markets.

From a volume-export standpoint, PSA's standings are modest. Its principal markets are Nigeria and Libya for Peugeot, Iran for Talbot (the contract dates back to the time of Chrysler). Now these countries are being affected

by the downturn in their oil resources. PSA's sales in Nigeria have declined from 87,000 vehicles in 1981 to 70,000 in 1982 and 61,000 in 1983; in Libya, from 33,000 in 1981 to less than 1,000 in 1982-1983; in Iran, from 73,000 in 1981 to 27,000 in 1982, rising again to 85,000 in 1983.

Whereas the Japanese are present throughout the world, and General Motors and Ford in North and South America and in Europe, the big European automobile makers have as their essential outlet Western Europe, which represents only 30 percent of world demand and where the Japanese, General Motors and Ford are chalking up points. Volkswagen is the most international, with old establishments in North and South America and a decision to open its doors to cooperation with the Japanese. Despite its controlling interest in American Motors, Renault remains above all European. Like PSA. And Fiat, despite its presence in Brazil.

Quite apart from PSA's case, it is the future of the European automobile industry, caught as it is between the jaws of Japanese growth and American ambitions, that hangs in the balance.

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CSO: 3698/338

AUTOMOBILE INDUSTRY

BRITISH GROUP DEVELOPS COMPOSITE SPIRAL SPRING

Paris AFP-AUTO in French 15 Feb 84 AFP141637 Feb 84

[Text] London, 14 Feb (AFP)--An important innovation in automobile construction was announced Tuesday by the British GKN [Guest, Keen and Nettlefold] group: Suspension springs made of composite material.

This British group, one of the world's leading manufacturers of components for automotive vehicles, has disclosed that after 7 years of research and testing, at a cost of over 4 million pounds, it has developed a process for manufacturing springs from a glass-fiber and epoxy resin composite, exhibiting many advantages over steel.

The group's directors have therefore authorized an investment of 6.4 million pounds for the construction and equipping of a plant capable of producing around half a million units of this kind a year initially.

Production is to begin in February 1985. These will be the world's first plastic springs. GKN believes, moreover, that it has at least a 2-year lead over its worldwide competitors.

These springs will be designed for medium-weight commercial vehicles. Research to date has in fact concentrated on this sector since it appeared to offer more rapidly realizable advantages. It is to be extended to include spiral springs for private cars as well.

According to GKN, the advantages of these springs over those made of sheet steel are many. The principal one is their light weight--half that of steel springs--enabling substantial fuel economies at a time when all vehicle manufacturers are seeking to lighten their vehicles to reduce fuel consumption.

In addition, their greater flexibility and better shock-absorbing capacity improve the vehicles roadability and passenger comfort while reducing noise. Another advantage: These springs lose their "temper" with wear and tear but will not break. And repairs are easier.

The big secret of this invention lies in the composition of the epoxy resin developed by the company's researchers.

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CSO: 3698/340

AUTOMOBILE INDUSTRY

BRIEFS

REVENUE FOR RENAULT PORTUGAL--Renault Portuguesa, a subsidiary of the French automobile manufacturer, saw its sales double in 1983: 14.15 billion escudos in 1982, and 28.86 billion last year. In addition, exports nearly tripled: 13.9 billion escudos in 1983, compared with 4.8 billion during the previous accounting period (100 escudos = 6.24 French francs). While the number of cars manufactured at the Setubal (south of Lisbon) and Guarda (Northeast Portugal) factories has remained about the same--37,300 in 1983 and 34,400 in 1982 (the models manufactured are the R4, R5, R9 and R11)--the number of 1,100 or 1,400-cc engines manufactured has considerably increased--220,800 in 1983 compared with 47,800 the year before--as well as the number of transmissions--97,300 in 1983 compared with 29,400--or water pumps--140,000 in 1983 compared with 79,000 in 1982. The engines, pumps and transmissions are manufactured at the Cacia factory, south of Porto. Renault Portuguesa started its operations during the summer of 1980; it is now employing 3,400 people. In 1982, Renault's share of the Portuguese market was 31.5 percent; it was followed by the Fiat group with 12.9 percent. [Text] [Paris AFP AUTO in French 8 Feb 84 No 3415 AFP 072008] 9294

RENAULT, U.S. FIRM LASER CONTRACT--Renault Automation has signed an agreement with the world's leader in lasers, the American company Coherent. Renault Automation, which is responsible for the group's production activities, will thus enter another stage in this field. The objective of this agreement for Renault, is to design, manufacture, and sell industrial-purpose automated machines and systems that make use of laser sources. These machines will be designed and sold by Laser Systemes, a joint Renault-Coherent company created by Renault's 51 percent participation in the capital of Laser Optronics France, a French subsidiary of Coherent. The machines will be manufactured by Renault Automation. The laser is becoming a reliable and profitable industrial tool, particularly for cutting, boring, welding, or heat processing, which leads to large improvements in productivity and quality. An alliance with a manufacturer knowledgeable in all the technologies of laser sources, will allow Renault Automation to follow the very rapid advances in this sector. At the same time, Coherent will benefit from Renault's competence in machine-tools and automated systems. As the world largest manufacturer of laser sources, Coherent has a worldwide industrial and sales network. Its 1983 revenue should be approximately 90 million dollars. [Text] [Paris ELECTRONIQUE INDUSTRIELLE in French 1 Feb 84 p 9] 11,023

CSO: 3698/323

CIVIL AVIATION

FINANCIAL, ECONOMIC COMMENTARY ON AIRBUS, EUROPEAN AVIATION

Paris LE NOUVEL ECONOMISTE in French 5 Mar 84 pp 66-70

[Article by Philippe Gazier and Jean Gloaguen: "An Airbus At Any Price"]

[Excerpts] A 13-billion act of faith. France finally managed to impose its new Airbus A-320 project. The European civilian aeronautical industry is staking its all.

Finally! After six years of efforts, the French government managed to convince Chancellor Helmut Kohl and especially Mrs Margaret Thatcher that they should embark on the Airbus A-320 adventure. The 150-seat twin jet will join the larger A-300 (260 seats) and A-310 (200 seats) in the Airbus family. Thirteen billion francs in investments will be provided by France and Germany (35 percent each), Great-Britain (26 percent) and Spain. The program will start with 96 aircraft for which 5 airlines have already placed orders or options; the first aircraft are scheduled to be delivered in 1988.

The stakes are of strategic importance. What is involved is no less than the survival of a civilian aeronautical industry in Europe, facing Boeing, now the only remaining U.S. company in this field. However, if the Germans and the British hesitated, it was because, commercially and financially, the gamble is far from being a sure thing. To recover the initial investment, at least 600 units must be sold. A number that has never been reached in Europe with any other jet.

The size of the financial risk involved, which unavoidably will be shouldered by taxpayers, raises the question: by making itself the champion of the Airbus project, is not France wasting its money and that of its partners? More generally, is not the civilian aeronautical industry, which is essentially supported by the Airbus and by the CFM-56 engine (produced in cooperation by SNECMA [National Aircraft Engine Study and Manufacturing Company] and General Electric) another bottomless pit like the iron and steel industry and the shipbuilding yards?

How much does each Airbus sold cost to the community? The figure is not to be found in any official document. It is true that, presented that way, the question could be answered beyond dispute only by stopping the European twin-jet manufacturing. Because of a well-known series effect, manufacturing

costs decrease progressively: for instance, the number of hours required was reduced by a factor of three since manufacturing began; it is now of 430,000. "Considering that we have now delivered 240 aircraft and that the present price of the A-300 and the A-310 ranges from 50 to close to 60 million dollars, Aerospatiale, the French project leader is not losing any money," a high official assured us.

However, Aerospatiale's accounting and the country's accounting are not the same thing. Actually, the country is taking the risks of the project, subsidizing exports and providing capital to the national company.

The Ticket. What are the risks involved in the project? Until now, the state has provided approximately 7 billion 1983 francs in "repayable budget advances." The rate of repayment of these advances, which bear no interest, is marginal for the first batch of aircraft sold, and increases then in steps. Thus, the initial A-300 schedule provided that 0.6 thousandth of the total amounts advanced would be reimbursed with each of the first 130 aircraft delivered; 1.70 thousandths from the 131st to the 150th; then 3.70 thousandths starting with the 151st.

In the past, the state has never recovered more than a symbolic percentage of its contributions. "There is nothing abnormal in that," according to Mr Michel Lagorce, director of civilian projects at the Ministry of Transport. "In the United States, transport aircraft are derived from military aircraft. Their development cost is therefore also borne by the state. The 7 billion francs spent by France on the Airbus can be seen as the ticket to pay to become Boeing's challenger."

State aid also takes another form: export subsidies. They too are said to reach 7 billion 1983 francs. Close to 90 percent of the 230 aircraft delivered had been ordered by foreign airlines qualifying for preferential financing conditions and guaranteed exchange rates. The so-called "jumbo jet" agreement between the United States, Germany, Great-Britain and France does provide for a coordination of interest rates (11.5 percent), maximum credit terms (12 years) and maximum percentage to be financed (85 percent). In practice, the Americans say that the French are outbidding them. At any rate, even if Airbus exports do not seem to get any preferential treatment that other French heavy equipment exports do not also get, we must acknowledge that the foreign currency thus acquired is expensive.

The Bill. Budget allocations to Aerospatiale are the last form of public expenditures. It is difficult to distinguish how much of the firm's capital corresponds to the Airbus. Nevertheless, the national company claims it must have stable funding to ensure that the project will not upset its balance sheet. In 1976, it went so far as to refuse to pay the amounts due as repayable advances to force the authorities to face their responsibilities.

When all is said and done, the Airbus would then cost some 15 billion francs. A figure comparable to the 2.85 billion francs in losses which a 1974 Aerospatiale study determined would be the cost of stopping production after

the first 200 units. The cost of each aircraft delivered would thus amount to close to 70 million francs. To be compared with the 120 million francs which each Airbus sold brings into the coffers of Aerospatiale.

Even then, the Europeans have the benefit of a strong dollar. The Boeing 707, on whose price the A-310 is aligned, is manufactured in the United States. If the dollar goes down, Airbus project officials will find themselves in a dilemma: either they will have to accept reduced amounts in francs or deutschemarks to remain competitive, or they will lose orders.

But present workload levels forbid them to lose the least client. In Toulouse, Bremen and Hamburg, some 20 Airbus are waiting to be sold. At 50 million dollars apiece, that is a 1-billion dollar inventory and, over one year, a trifle of some 100 million dollars in unexpected financial costs.

Uncertainty. In the long run, no one doubts that air transport will expand and the medium and long-haul fleets will be renewed and increased: Boeing estimates the demand at 167 billion dollars until 1995. But we do not know when these purchases will materialize. Because of this uncertainty, McDonnell-Douglas and Lockheed have already given up. Boeing, which had already reduced its personnel from 145,000 to 55,000 during the depression of the 1960's, has further reduced it now. Aerospatiale does not have as much room to maneuver. Yet, its president, Mr Jean Martre, is warning: "If we want to remain competitive, we must do something about our variable costs."

In this context, the decision to start the A-320 project appears indeed to be an act of faith. Certainly, manufacturers' market studies show that over 3,000 medium-haul 100/200-seat aircraft will be built before the year 2000, and that the new Airbus could account for 750--150 above its profitability threshold. In the past, these studies have always proved overoptimistic. The new A-320 suffers from a formidable handicap: unless a miracle occurs, the U.S. market will be closed to it because of the "Buy American Act." Therefore, a few weeks before the 1981 presidential election, Mr Valery Giscard d'Estaing cautioned: "If the project proposed can rely on the firm commitment of several airlines, on a technology giving it a permanent competitive edge, and on reasonable prospects for economic profitability, then I shall support it." At the same time, his challenger, Mr Francois Mitterrand, had made up his mind: "We must add to the Airbus family which is too small to ensure that the European industry can continue to manufacture airliners." These words are echoed today by his brother Jacques, head of GIFAS (French Aeronautical and Space Industry Group) and former president of Aerospatiale, who now states: "I do not know if we will ever earn any money with this program, but I am sure that we will lose some if we do not go ahead with it."

What would we lose? First, of course, an opportunity to continue one of the few large European industrial realizations. Is this what prompted Mrs Thatcher, who had been reluctant for a long time, to engage her country in the A-320 project? Or was it that Sir Adam Thomson, head of the private British Caledonian airlines, became an ardent supporter of this aircraft while, on the contrary, the national British Airways chose Boeing?

Stepping Aside. The A-320 is not just a sign of political goodwill; it is also the consequence of a marketing logic. "One of Boeing's major assets is that its offers to airlines can include two different types of aircraft," Mr Lathiere explained. As they are determined to enlarge their line, the Europeans had considered a 4-jet 220-seat long-haul aircraft, the TA-11 which was derived from the A-310. It was designed to replace the Boeing 707 and the Douglas DC8. But after spending several tens of millions of francs on the project, the management of Airbus Industrie decided to abandon it. That was because Boeing clearly announced its determination to launch, maybe already this year, an aircraft derived from its 767 twin-jet, the 767-300 which could cover 6,000-7,000 nautical miles and carry 220 passengers.

After stepping aside and out of the way of the Seattle giant in the field of long-haul aircraft, France decided to plead for the 120/160-seat short and medium-haul subsector, which it had also been eyeing for a long time. The result was the A-320 although, apart from British Caledonian, the airlines already interested are either predictable (Air France and Air Inter) or rather small (the Cypriot airlines Cyprus Airways and the Yugoslav airlines Inex Adria). And also although Mr Tex Boullioun, Boeing senior vice-president, recently came to Paris to offer a European-U.S. cooperation, pointing out that at least 80 aircraft of this type would have to be manufactured every year to make it profitable.

"Apart from financial concerns, what is really at stake is to know if we want to have a civilian aeronautical industry," Mr Lagorce said. If the answer is yes, the true issue is: what benefits does France derive from having a civilian aeronautic industry which was allocated 2.1 billion francs in the 1984 budget, for development credits and program authorizations alone? Roughly, this industrial sector boils down to the Aerospatiale aircraft division (Airbus and the future ATR-42 commuter plane), the manufacturing of the SNECMA CFM-56 engine, the production of the Falcon business aircraft by Dassault, and a host of equipment manufacturers and subcontractors.

Free-For-All. It is a small world, and one that represents only a relatively modest number of jobs: 35,000 people, one third of which work for Aerospatiale. Yet, it weighs heavily in certain regions, for instance around Paris, in the Southwest around Toulouse and in the Nantes-Saint-Nazaire area. As a result, work sharing among the various parties turns into a veritable free-for-all whenever there is international cooperation. This was again the case with the A-320. After a slight correction was agreed on last December at Ottobrun (near Munich), at the headquarters of Messerschmitt, the large German partner, the French were to do 35.63 percent of the work, the Germans 35.42 percent, the British 25.22 percent and the Spanish 3.73 percent. We were told that it took one hour of discussions to agree on the second decimal. "As far as Aerospatiale is concerned, the project will materialize in the form of work only late in the summer of 1985," we were told by Mr Jean Pierson, director of the company's aircraft division. However, already this year, he will provide 550,000 hours of studies and 600,000 hours of factory work.

Manufacturing aircraft or civilian aircraft engines also amounts to generating a lot of technical progress. Even though the notion of "spin-offs" was hackneyed to the point of becoming a caricature to support the Concorde project, it contains a large part of truth. Aircraft, whether transport or fighter aircraft, require expertise in a whole series of advanced technologies. They are a privileged testing ground for new materials like composite fibers or aluminum-lithium alloys; the electronic equipment of their cockpits keeps increasing. A lot of innovations go into their engines.

The aeronautical industry is also a pioneer in the field of computer-aided design and manufacture. In this specialty, the Aerospatiale aircraft division is using some sophisticated software called SIGMA (Interactive Assisted-Geometry System) which simplifies the making of models and fuselage components.

Apart from jobs and technology, the civilian aeronautical industry is also a substantial source of foreign currency: the equivalent of 10 billion francs or so in 1983, i.e. half the surplus generated by the automobile sector. At current prices, the 230 Airbus sold brought in 30 billion francs or so. Did you know that SNECMA's CFM-56 engine has made it the second French exporter to the United States? And that it was in the United States that the Dassault Falcon famous?

We have already mentioned the high cost of these exports; we should now add to it the risk of insolvency of certain potential clients, as was evidenced by the problems encountered in providing financing for Sudan Airways or the Brazilian Vasp airlines.

Because of the risk and cost involved, France cannot be overambitious. In 1984, two thirds of the budget credits for the national civilian aeronautical industry will go to the Airbus project (to continue the A-300 and A-310 and start the A-320) and the CFM-56 jet engine. Actually, the latter will soon have a version adapted to the propulsion of 150-seat airplanes. The A-320 will then deserve to be called a European aircraft.

It will still have to prove that, contrary to other operations that have Brussels' blessing, it is not a subsidy trap.

9294

CSO: 3698/356

COMPUTERS

SIEMENS TO REGROUP DP, TELECOM ACTIVITIES IN ONE DIVISION

General Terms of Reorganization

Paris ELECTRONIQUE ACTUALITES in French 17 Feb 84 p 4

[Text] On 1 April, the German electrical equipment giant, Siemens, will put into operation a reorganization plan that will consist of regrouping its data processing and private telephony activities into a single division.

The entity thus created will represent an annual revenue of the order of 15 billion DM (around 45 billion francs), a sum equal in size to the financial reserves of all of Siemens put together.

A new stage begins on 1 April in the evolution of Siemens. On that date, the group will bring into being, for Germany initially, a reorganization that will make of its largest subsidiary a data processing giant as big as the group's electrical equipment activity itself. The new data processing division will embody in one unit the entity that is presently responsible for data processing activities and the section of the group's telecommunications subsidiary that deals with private telephony, leaving only public telephony in the hands of the telecommunications subsidiary.

The new data processing group will represent an annual revenue of the order of 15 billion DM (45 billion francs), and will specialize across an extended spectrum in the domain known as business communications. A group of considerable size is thus in the process of being created, with product lines as complementary as high-powered central processors (IBM-compatible up to a theoretical 27 MIPS [million instructions per second]), minicomputers, the manufacture of laser printers, videotex systems, communications management systems, etc.

This reorganization also provides the group a vehicle for a more extensive penetration of a technology in which it is already present, but in additional forms (numerical control, for example). It also improves the group's chances of penetrating foreign markets, where its presence is now hardly existent, in data processing as well as private telephony, making the most of a synergistic effect.

The situation in France is indicative in this regard.

In private telephony, its presence is actually not very significant, for reasons inherent in the presence of powerful national manufacturers in this field. In data processing, the group is just now recovering from the misfortunes that plagued it following the failure of Unidata, the attempt to bring all European data processing under one wing, in which it had invested heavily.

Past resentments still rankle in the minds of everyone and, in 1979, when it tried to renew its data processing activities, Siemens had to start again from scratch after several years of absence from the French market.

In the 5 years since, Siemens, last year, succeeded in attaining a revenue of 120 million francs in the Hexagon [mainland France], placing a total of 50 mainframe computers (10 of which are IBM-compatibles of Fujitsu origin), some 60 laser printers, and some 50 minicomputers.

This new reorganization is also intended to prepare the group for entry into new activities. It is presently negotiating with Fujitsu for the European distributorship of the latter's new vectorial calculators.

In addition, while it sees itself fully capable of carrying out its business communications strategy without outside help, Siemens sees no reason why it should not acquire from others any technology that it might be lacking at any given moment.

Extremely well managed as it has always been, the group has liquid assets totaling some 12 million DM (approximately 36 billion francs), or more than one-fourth its annual revenues, at its disposal to be thrown into its business communications venture, into carving out a position in foreign markets, or into unconstrained talks with any potential partner.

Details of Reorganization Plan

Paris ZERO UN INFORMATIQUE HEBDO in French 2 Jan 84 p 4

[Article by GH]

[Text] Siemens, the German colossus and one of the world's leading companies in the electronics sector, plans this year to reorganize its activities, grouping everything concerning data processing, peripheral processing and telecommunications in one and the same division. Its mainframe-systems catalog includes the Siemens-designed 7500 family, which represents 90 percent of its sales, and the 7800 line of Fujitsu-manufactured IBM-compatible units, which makes up the remaining 10 percent.

Five divisions are more or less currently involved in data processing activities, manufacturing hardware as diverse as mainframe computers, telephony equipment, laser printers, and terminals.

As of 1 April 1984, Siemens will begin a restructuring designed to concentrate all its data-processing and telephone-communications product sales efforts in one and the same division. Although presently to be implemented only within the FRG [Federal Republic of Germany], this reorganization will of course, in time, be extended to all its subsidiaries.

From 0.2 To 27 MIPS

Once in place, this new division is to be the Siemens group's largest in terms of annual revenues, totaling close to 40 billion French francs and one-fourth of the group's total revenues, and on a par with its Energy and Automation Division.

The present data processing division, which markets principally the two 7500 and 7800 lines, employs 15,000 persons and had 8.24 billion DM of revenues during its 1982/1983 fiscal year ending 30 September.

Having run a deficit over the past several years, its net profit/revenue ratio today is excellent, owing particularly to a substantial cut in operating expenses. Its total computer sales now number 3,500 installed units comprising 2,500 systems in its 7500 line, 900 systems in its 7700 line, and 140 units in its 7800 line.

Entirely of Siemens design, its 7500 line comprises five basic models (7521, 7531, 7536, 7550 and 7570) whose computing powers extend over a range from 0.2 to 7 MIPS [million instructions per second] and function under the BS 2000 operating system.

The last two models (7550 and 7570), introduced a few weeks ago, now represent the middle and top of the 7500 line. Designed around the same basic model, the three versions of the 7550, from Models B (0.8 MIPS) through N (1.8 MIPS), can be converted, in place, from monadic-type to dyadic-type processors, with one or two input/output processors. Similarly, the 7570 can be upgraded from a Model B unary type (2.2 MIPS) to a P System (7 MIPS) binary type, capable of supporting up to four input/output processors. The memory capacity of the 7550's can be upgraded from 2 to 16 MO [million operations], and that of the 7570's from 4 to 64 MO.

Partial results of the Unidata venture, which, we will recall, combined the efforts of Siemens, Philips and Bull: The 7700 line of computers is no longer manufactured but continues to operate under the BS 1000 and BS 2000 systems, which facilitates migration toward the 7500's under the BS 2000 system. Siemens is also present in the IBM-compatibles market, where it markets the entire Fujitsu line under the 7800 designation.

The latter is articulated around two basic units, the 7860 and the 7890, offering a power range between 2.7 and 27 MIPS, equivalent to that covered by IBM systems from its top-of-the-line 4341 comprising its recent 4381 Models 1 and 2, to its 308X's.

This offensive into the IBM-compatibles market is not a major activity for Siemens, since in terms of sales it represents only 10 percent those of the 7500's.

But neither, for that matter, is it negligible, and furthermore, it enables the German firm to introduce itself to our big users. While it enjoys exclusivity in Germany, its distributorship of the 7800's theoretically runs into competition from ICL's Atlas 10 and 25 in the other European countries, except in Spain where Fujitsu handles directly the distribution of its own products.

In exchange, the Japanese firm distributes Siemens's laser printers, of which it has sold 200 units, or 20 percent of the total in place. The ratio between 7500 and 7800 sales over the years to come should remain about the same as today.

Microcomputers That Lie in Wait

Relatively absent from the microcomputer data processing field, Siemens has nevertheless introduced (see ZERO UN INFORMATIQUE HEBDO No 776) a top-of-the-line multiposition microcomputer, the 9780. Capable of supporting four work stations, this microcomputer operates as a free-standing unit under the Sinix system (a version of Unix) or linked to computers of the 7500 and 7700 series under the BS 2000 system, via the Transdata remote processing system.

Based on a 16-bit microprocessor, an Intel 8086 (Siemens is a second supplier of the Santa Clara-based firm), the Transdata 9780 system has a central memory of 256 KO [thousand operations] that can be upgraded to 1 MO and should be available during the second quarter of 1984.

Siemens is now offering a single-position version with the same technical characteristics, at a starting price of around 45,000 French francs.

By way of these two introductions, the German firm will be seeking to interest its clients in smart terminals capable of operating in a local mode and of being connected to in-house central computers, but it is not aiming at the microcomputer data processing niche. In other words, the German firm is not at all seeking to position itself as a supplier of personal computers.

Soon Half Outside the FRG

After having abandoned its activities in the Hexagon [the French mainland] around the beginning of 1973 and returned here around 1978, Siemens Data France then pursued what its management termed "a normal evolution." After having introduced its 7500 line in 1979 and its 7800 line 2 years later, the French subsidiary's sales now total 50 machines in place (40 units of its 7500 line, 10 units of its 7800 line).

The Paris and Nancy Savings Banks, Thomson-CSF, SG 2, Monoprix and Jeumont Schneider are among its IBM-compatible 7800 line computer clients.

It also markets its laser printers, of which it has installed some 60 units, a large number of them in establishments specializing in the mail-order business (7 systems for La Redoute).

Employing a staff of 160 persons, it had revenues of around 100 million French francs in 1983 and is expecting a 30-percent increase during the succeeding operating period.

This new division is expected to provide the spearhead of the group with regard to its plan to increase the share of its revenues earned outside the FRG from its present one-third to one-half between now and the end of the decade.

Activities of the Five Divisions Involved
in the Forthcoming Reprganization

<u>Division</u>	<u>Data Processing Activities</u>
Data Processing (D)	Mainframe computers (7500, 7700, 7800 series); peripheral processing; applications programs.
Communications (K)	Public and private telephony; word processing equipment; laser printers; terminals.
Energy and Automation (E)	Process-control computers; management mini-computers.
Components (K)	Microcomputer cards.
Medical (M)	Medical electronics equipment.

9399

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COMPUTERS

STRATEGY, NEW PRODUCTS OF BULL IN FRANCE

Interview With Marketing Director

Paris ZERO UN INFORMATIQUE HEBDO in French 9 Jan 84 pp 4-5

[Article by J.M.C.: "Michel Bloch, Marketing Manager at Bull: 'Four Lines of Mini To Remain Second in Europe'"]

[Text] Is it easier to merge companies than to rationalize production? SEMS [European Minicomputers and Systems Company] had proved unable to choose between the Solar and Mitra lines. The new Bull company wasted no time and added the Mini-6 line and, for good measure, decided to industrialize the SM-90. Even if we overlook its competitors at the low end of the range, the Micral microcomputers, the leading French company (and its customers) now must handle four different lines of minicomputers manufactured in its factories. Is that an asset or a handicap?

Michel Bloch, the Bull marketing manager, first pointed out that, no matter where they are made (the Mitra, Solar and SM-90 at the Bull-SEMS factory near Grenoble; the Mini-6 at the Bull Systems factory at Joue-les-Tours), Bull has only one sales department, which is headed by Didier Ruffat.

Based on the group's overall marketing strategy, each of the three sales networks ("France," for direct sales in France; "General Distribution," for indirect sales; "International," for direct or indirect sales abroad) is responsible for its own marketing, for each of the four product lines.

But why does Bull want to retain several lines that obviously compete with one another?

The Mitra Line

According to Michel Bloch: "We now consider ourselves as the second European microcomputer manufacturer, and we intend to keep that rank or improve it."

"This means that we must retain our present positions. Obviously, the Mitra and Solar lines are competing with each other. That was true even before Bull gained control over SEMS. Yet, each of the two families has its own clientele and its special applications which we wish to preserve."

"Therefore," he added, "as far as the Mitra family is concerned, we shall continue to manufacture and sell it to those who have invested in this type of equipment, and for certain types of applications (in hospitals, for instance) for which they are well suited."

Yet, although the Mitra 725 is a more powerful product in the line, apparently no additional effort is being made as far as software is concerned. Is that the first step toward obsolescence?

"Certainly, Mitra sales are not going to progress at the same rate as Mini-6 sales. Yet, in absolute value, we see no decline for the time being, quite to the contrary. We are even beginning to receive more orders."

Solar at the Factory

What about the Solar line?

"The situation is simpler. The Solar succeeded the T-2000 and T-1600 and was quite successful, even internationally, in the very specific field of industrial applications."

"In that sector, the Solar line is all we have to offer, and that is why we are completely overhauling it, the software being included this time."

Can the Solar look forward to a brighter future than the Mitra?

"At present, they represent about equal shares of the market, but the Solar line sales should grow faster. The industrial sector," Michel Bloch added, "requires special competence and relations with engineering companies, and these happen to be the strong points of SEMS."

How come Bull is not yet manufacturing a 32-bit industrial computer?

"It is true that we are still interested in this old question, in that we are looking for an outside supplier. We do not plan to develop ourselves a 32-bit computer, but we shall manufacture it. Yet, we must admit that there is now a far greater demand for 16-bit computers."

The Researcher's Work Station

What is the SM-90 supposed to do?

"It is a very particular piece of equipment--I would call it "the researcher's work station"--for which there is a demand in engineering companies that wish to develop specific software. It can also be used for telephonic and peritelephonic applications."

"Besides, SEMS had production capacities. It will also be in a position to modify the product, which was originally developed by the CNET [National Center for Telecommunications Studies], which is not interested in industrial production."

However, these various development paths appear limited. In the long run, what will SEMS gain from its alliance with Bull?

A Specialized Company That Is Easy to Deal With

According to Michel Bloch: "SEMS' name was not known as a matter of course worldwide, and that would hinder its development; but Bull is. On the other hand, Bull was hardly represented at all in the industrial and scientific field. Also, we believe that small or medium-size users prefer to deal with a company which is a specialist and is easy to deal with. We feel that, by retaining the various lines, we offered a good compromise to the client."

Let us now deal with the choice piece, the Mini-6 line, whose low end was just completed.

An Office Automation Server

"It is our management battle horse," Michel Bloch confirmed; "the Mitra, as you know is supported only to preserve past investments. Our new offers will of course be based on the Mini-6."

"We believe that the demand for management minicomputers will keep growing, especially due to the expansion of office automation."

Yet, the name "minicomputer" seems old-fashioned. Most manufacturers now boast of producing "micros." Honeywell itself calls its 6/10, which is now appearing in France under the name Mini 6/10, a "micro." Why this obsolete vocabulary?

"Today, the connotation of the word 'micro' is that it is a personal computer --the Micral which is used for professional applications. Honeywell is offering a cheaper version of the 6/10 without the Mod 400 software. We have a different approach. We see the 6/10 as the cheapest point of entry into a family working under the Mod 400 software."

How will the competition between the Micral and the Mini-6/10 end up?

"That will depend on what the user wants to begin with. If he is planning to grow, if he needs several power levels, we shall direct him to the Mini-6 line."

"Obviously," Michel Bloch concluded, "our strategy is still based on the 'minicomputer,' with the lowest possible point of entry."

Details on New Products

Paris MINIS ET MICROS in French 13 Feb 84 pp 25-26

[Article by Violaine Prince: "Bull Is In Top Form: A Battery of New Products, From Minicomputers to Microcomputers"]

[Text] Within a few weeks, Bull made major announcements covering the whole range of minicomputer management, scientific and industrial applications using Mini-6, Mitra,

Solar and SM-90 computers. But its most important progress materialized with the introduction of the 9020 model, the latest in the Micral family which therefore reaches the low end of the line, the level of the various personal computers. This was a strategic decision that Bull could not postpone any longer, considering the growth rate of this market.

The group's broad divisions which we discussed twice last year, and about which we had some reservations, have been changed. After one year, Bull top executives may have understood that the overall strategy they had adopted somehow sacrificed personal microcomputers which were lumped in a fuzzy category vaguely called office automation. At any rate, they took a turn that materialized in two decisions: dividing operations between Micral and Transac, and introducing the 9020 model.

Bull-Micral's Positions and Objectives

According to Jean Valent, Micral chief executive officer, the Transac-Micral joint market objectives are as follows:

- in large-system type environments, to concentrate on connections;
- for open-ended systems, stations, intelligence decentralization: ergonomic and multi-task functions;
- in stand-alone environments, which are more particularly represented by microcomputers: to stress the ease of implementation;

bearing in mind that significant interactions exist between these three objectives. From now on, Micral will concentrate on the third, whereas Transac will deal more particularly with the first two. In other words, each will go undisturbed about its business.

From a legal point of view, Micral will take the position of a Transpac subsidiary. Its lines of operations will also be determined as follows:

- development of internal products, i.e. the 90 family;
- external product complements: licenses, original equipment manufacturers;
- software: Prologue, which is available to other manufacturers, the Prologue team being destined to become an independent operation with its own means, managed like a subsidiary; this is a rather important decision, as it restricts Prologue's part to that of a mere distributor;
- finally, service to the non-professional: assistance, which is sorely lacking today; carefully prepared documentation, which users have been expecting for two years.

Finally, the company is trying to revive the former R2E [Electronic Realizations and Studies]. After merging, the company is dividing again, as it has understood that a smaller organization would in the long run be more productive and probably easier to control.

Equipment

The market Micral is aiming at is that of the \$3,000-10,000 range: i.e. neither Sinclair's nor Apollo's. The 9050 multistation model (1 to 4 stations) introduced over 1 year ago and produced at the rate of 700 units per month is at the top end of the line. The 9020, the new model, is a single-station computer based on the Intel 8088 microprocessor, whose main technical characteristics are as follows:

- a central unit including the microprocessor, 256 K [8-bit bytes] of RAM and the diskette couplers;
- a 25x80-column alphanumeric and graphic screen; display: 640 x 288 pixels; addressing: 1,024 x 432 pixels, which is not bad;
- a 100-key keyboard identical to that of the 9050 model;
- one or two 5-1/4" diskette drives (600 K each) or a 5-megabyte Winchester disk drive;
- as needed, a whole range of 100 and 200-cps, 80 or 132-column printers, both graphic and letter quality;
- finally, for software, Prologue in its MS/DOS and CP/M-86 settings, the rich potential of which was eventually discovered by Bull which now cannot stop marvelling at it.

The price is quite reasonable: 23,900 French francs for the central unit and the keyboard-screen without the diskette units; 36,100 French francs with the two diskette units and Prologue.

1983 and Future Prospects for Bull-Micral

"1983 has been a year of transition, reflection and restructuring," we were told by Jean Valent, a year during which the general distribution network (which now includes 150-180 dealers) was set up, management teams strengthened with the addition of Georges Seban, formerly of Logabax, who is now advisor to the President, and sales grew by only 12 percent--although a worse performance was expected. As far as its plans are concerned, Bull-Micral hopes to increase its line of equipment and software, open four or five Bull promotion centers, somewhat like the Xerox stores or Club Mediterranee--which are great to keep clients informed--and retain the characteristics of a small/medium-size firm to keep pace with the rapid evolution of the market; better late than never. Micro could well achieve sales of 1 billion French francs in 1985/1986: this is something to look forward to.

Minicomputer Announcements

Announcements concerning minicomputers--which are probably more interesting from a technical point of view, although of lesser strategic importance--were made very discreetly, possibly not to tarnish the glamour of the "microcomputer revolution" which Bull is accomplishing. We shall review them quite as briefly, as technical details will be published in our next issue, under "New Products."

Know then, that three new Mini-6 were introduced at the low end of the line, the 6/10, 6/210 and 6/290 models respectively, which are designed for the present Mini-6 clientele as well as for all potential users of stand-alone or network management minicomputers.

The 6/10 is the entry model of the line; it is a single-station computer that can be operated in the micro mode, under CP/M 86 and MS/DOS. Otherwise, it works in connection with another Mini-6 or an IBM (3278 emulation). With 512 K of RAM and 2x650 K of diskette memory, it sells for 50,000 French francs, a very reasonable price; actually, it is a very good micro that will be used mainly as a work station.

The 210 is a multi-station computer (1 to 4 stations) of the supermicro type, operating under Mod 400, with a 16-bit bus at 6.6 megabyte per second, and memory capacities similar to those of equipment in its category. It will sell for 141,000 French francs with two 8-inch disks of 20 megabytes each, which is also a reasonable price, maybe even more reasonable than that of the Micro-mega with similar specifications, especially since Unix will soon be available for the Mini-6 under its V-7 version which is far more common than the Sol version initially intended for it. Finally, the 6/290 is designed for the 4-16 work station range, and the basic version will sell for 167,000 French francs.

We should also note that the Mitra line has now acquired its high end model, the 725, and a low end "compact" version (i.e. a microcomputer), the 225. The 725 can address 16 megabytes, it has a cache memory of 32 K, a disk-access accelerator and the same software: the basic price is 486,000 French francs.

Finally, the Solar line is renovated with four new models: 16/35, 16/70, single-processor 16/90 and dual processor 16/90, which range from the single-board model with many options to the industrial, scientific and real-time top-end model of the "computing center" type. Prices range from 90,000 to 1.8 million French francs, depending on the options and on the models.

As for the SM-90, it had been much talked about for over a year. Bull-SEMS [European Minicomputers and Systems Company] finally industrialized the CNET [National Center for Telecommunications Studies] machine and is now announcing the first versions of its multiprocessor system with Cynthia disks and Unix V-7 (only!...), a machine with which our readers are quite familiar since we have described it in detail more than once. Selling price: 200,000 French francs. Privileged field of application: scientific.

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CSO: 3698/345

COMPUTERS

FRANCE'S BULL ADDS DUAL-PROCESSORS TO DPS 7 LINE

Paris ELECTRONIQUE ACTUALITES in French 16 Mar 84 p 6

[Article by Ph. M.]

[Text] Bull has just bolstered its line of medium capacity computers, the DPS 7, with three new redundant dual-processor models, 80 percent more powerful than the previous leader of the line. At the same time, the Gcos 7 operating system replaces the former Gcos 64 system on all DPS 7's, providing them with a broader area of applications.

The DPS 7/60 P, 7/70, and 7/80 are now available in dual-processor configurations, to which they can be upgraded on site.

With the announcement of its first dual-processor models as part of the only computer line for which it is actually the prime-contractor, Bull offers its users about 1.8 times more power (at least that is what it announces officially) and the possibility of redundancy, in order to respond to new demands.

This announcement, the first from the Bull-Systemes subsidiary since the group's reorganization, becomes even more significant since the theoretical power of the equipment makes it competitive with the models 1 and 2 of IBM's 4381, announced by the latter company several months ago. They thus reach a computation speed of the order of 2-2.5 MIPS.

In another respect, this new equipment reflects Bull's success in producing high reliability systems within the limits of its capabilities, since the management of the Angers plant has been renewed (by integrating former IBM employees). During the presentation of this equipment, Mr Weber, director general of Bull-Systemes, pointed out that the production plans made at the beginning of 1983 were encouragingly on schedule.

This is particularly welcome since the DPS 7's are intended to support the group's future strategy in large scale information processing (probable allusion to the possible cancellation of agreements signed with Trilogy for this line).

The particular importance of this family of products is made even clearer by the following figures: the DPS 7 represents 40 percent of Bull Systemes' revenue and 25 percent of the group's total turnover. While this system is the only one fully produced by the company, it also represents its most significant exportation success since Bull has made two-thirds of its sales in the form of 2000 systems abroad, 1000 of which on the American market (these figures include the 64 DPS, predecessor of the DPS 7). At the same time, the group has launched a new operating system, the Gcos 7, designed for the entire DPS 7 line as replacement for Gcos 64.

Offered in two versions, one for small systems with up to 256 terminals, and the other for medium size systems with up to 1000 terminals, this software is intended to further open the equipment to the outside, and adapt it more suitably to various user needs.

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CSO: 3698/324

COMPUTERS

BRIEFS

BULL OFFICE AUTOMATION PLANS--The Kayak project carried out at INRIA (National Institute for Automation and Information Processing Research) has made it possible to develop competence in integrated office automation systems and associated technologies, such as local networks, multifunction work stations, and so on. The results of this project have elicited the interest of Bull-Transac, which decided to base the development of its new line of equipment and services on the experience that has been acquired. [Text] [Paris MINIS ET MICROS in French 30 Jan 84 p 14] 11,023

CSO: 3698/324

FACTORY AUTOMATION

ITALY'S FIAT USES SWEDEN'S ASEA SEEING ROBOT

Milan MONDO ECONOMICO in Italian 22 Mar 84 p 73

[Article by C. Ar.: "It Sees in Black and White and Has the Asea Trademark"]

[Text] "Seeing" robots are now among us. Having emerged from their long adolescence in the university and research center laboratories, they have come of age for the production line. The company preparing to put them into production is Asea, the industrial group of Vasteras, Sweden, that had a turnover of 6.3 billion in 1983, has 3,000 machines installed in some 20 countries, and is one of the largest robot factories in the world.

At the Corsico Robot Center, in the southern suburbs of Milan, one can now admire one of its most famous manipulator robots (an articulated arm capable of welding, supplying machinetools in production islands, and handling parts). The robot is equipped with a vision system and in less than a second is able to recognize and process up to eight different items arranged in quantity on a transporting belt.

Until yesterday, the production world had regarded "seeing" robots as insufficiently reliable. Their slow rate of processing of the image was a serious handicap and greatly slowed the work rate. Another limitation was the illumination that the binary vision system (the one in widest use thus far) received. The 12,000 lux required to illuminate the area made the robot's work position look like a movie set. The only reported application in Italy has been by Fiat, which uses an Asea robot linked to a binary vision system to mount, off-line, locks on doors.

Aurelio Fanoni, director of the Corsico Asea center, said: "Our 'seeing' robot is a step forward. The main difference is that the robot does not need any special illumination to operate. A good ambient light is adequate, and it operates by analyzing contrast between at least 64 shades of gray."

In the Corsico demonstration, the robot demonstrates how vision solves particular problems of organization of work flow. A 'blind' robot that has to handle eight different versions of a part requires eight storages, eight manipulation points, and appropriate supply systems. By contrast, Asea's "seeing" robot works with one conveyor and a single storage that can hold various parts in bulk. The telecamera's eye is fixed and recognizes the objects when they stop in the collection area. The robot receives from the eye the coordinates and the data that it uses to move to grasp the object at the correct position. The vision system was developed in the Vasteras

laboratories and will be exhibited in Milan during the Sixth Robot-Automation Fair.

Aurelio Fanoni said: "The big auto companies that use our robots received an advance showing of it in June, and a first group of machines has been installed for experimentation." Asea has thus arrived on the market first with a product on which all the largest electronics and automation companies in the world have been working for some time, from Hitachi to General Electric to IBM.

Two years ago, also Olivetti, after having reached an agreement with Westinghouse to produce its Sigma robot in the United States, had exhibited in Italy a model of the same robot with a vision system provided by the American company. However, it was a prototype not yet ready for industry: it took almost 8 seconds for it to recognize the part and to grasp it in the right position.

In the Comau laboratories, Fiat's automation factory, the effort is being made to add vision to the Polar robot for mounting wheels on the Ritmo. "The vision aspect is one of the research topics included in the National Research Council's final robotics program," according to Marco Somalvico, director of the program and developer of a robot vision system produced in 1980 as part of the Milan Polytechnic's artificial intelligence program.

However, how much will the eyes of an industrial robot cost? At Asea they say: "Between 40 and 80 million, depending on the number of telecameras used."

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MICROELECTRONICS

FRENCH INSTITUTE STUDIES EUROPEAN PATENTS FILED JAN-JUN 1983

Paris INDUSTRIES ET TECHNIQUES in French 20 Feb 84 p 25

[Article: "France Is the Only One To Be On the Decline"]

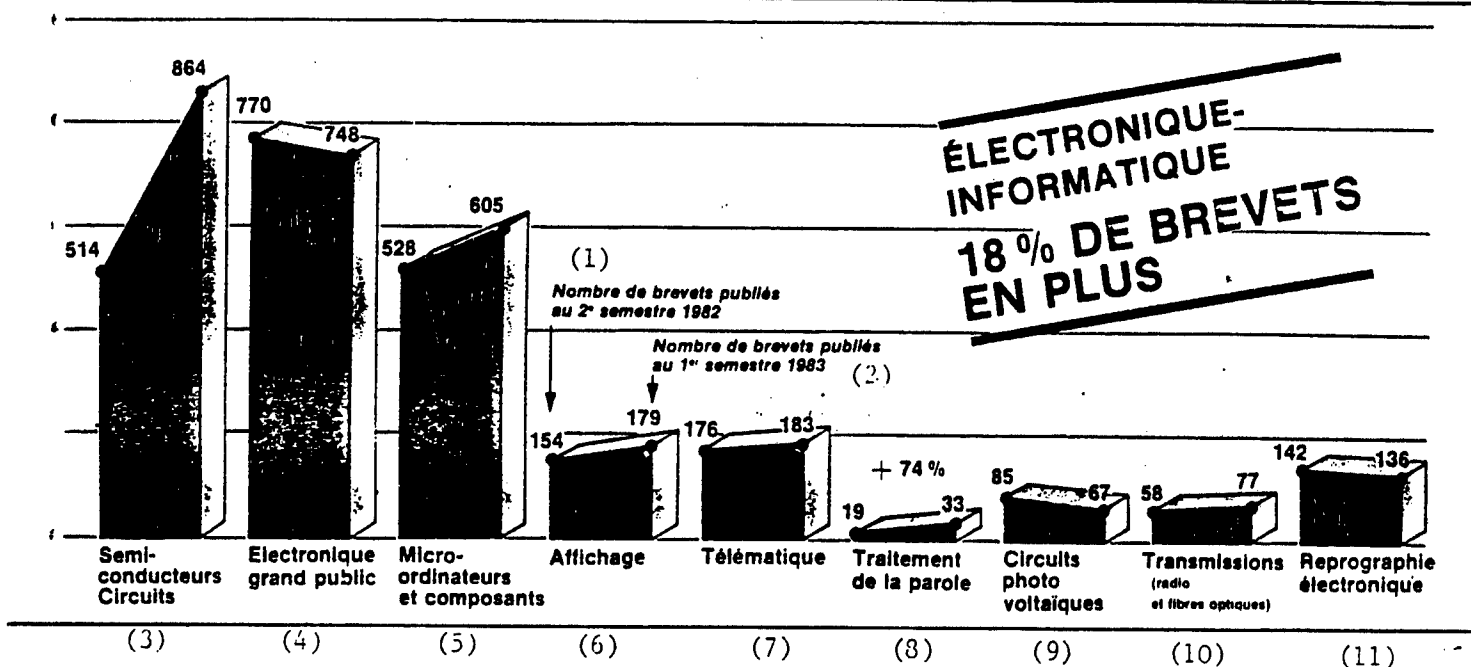
[Text] With the United States and Japan in the lead, all countries are increasing the number of their patent applications in Europe in the field of electronics... except France. Basic circuits and semiconductors are still causing a turmoil.

During the first half of 1983, 2,892 "French and European" patents having to do with electronics were published. That is an 18 percent increase over the previous half-year, which shows the vitality of the sector. All large filing countries are contributing to this progression... except France whose activity dropped by 11 percent! This situation is all the more disturbing as the figures published by the French Patent Institute refer to patents filed in France, i.e. on our territory.

The United States remain the leader by far, with 35 percent of all applications and a progression rate of 33 percent. The gap with Japan--the brilliant second accounting for one fourth of all applications, with a progression rate of 20 percent--is getting a little wider. With 15 percent, France comes third--the balance is biased in its favor--closely followed by the FRG (12 percent).

The champion among all firms, IBM alone accounts for 7.4 percent of all patent applications. It is followed by three European companies: Philips (Netherlands) with 4.6 percent; Siemens (FRG) with 4.2 percent; and Thomson (France) with 4.2 percent). These are closely followed by three Japanese companies, Hitachi, Fujitsu and Sony, each accounting for close to 4 percent. Impressive group fire.

Close to one third of all patents published (corresponding to applications filed 6 or 18 months before) involve basic electronic circuits and semiconductors; one fourth deals with consumer electronics and one fifth with computers and their components. Activity in the latter sector is very strong in the United States (+36 percent).



Electronics and Data-Processing: 18 Percent More Patents

- Key:
1. Number of patents published during the second half of 1982
 2. Number of patents published during the first half of 1983
 3. Semiconductors, circuits
 4. Consumer electronics
 5. Microcomputers and components
 6. Displays
 7. Data communications
 8. Voice processing
 9. Photovoltaic circuits
 10. Transmissions (radio and optic fibers)
 11. Electronic reprographics

Four technologies are in a turmoil: multiprocessor systems, distant input/output terminals, digital capacitor memories, and specific computer applications, especially numerical controls for machine-tools.

In consumer electronics, the overall activity showed a slight decline. But Japan clearly remains the leader, with Sony and Hitachi. Three technologies are especially active: magnetization recording, optical recording and television.

Applications concerning semiconductors and circuits are those with the strongest growth (+68 percent). Therefore, it is also in these fields that France comes off worst (-12 percent). Siemens (FRG) becomes the leading filer (60 patents). Favorite subjects are: details of individual semiconductor devices and associated manufacturing processes.

Two other subsectors show considerable progression: display and display control, where Thomson ranks second behind IBM (liquid crystals, semiconductors and especially plasma) and transmission, where optical fibers account for over three fourths of all patents. It should be noted that the number of patents on voice processing increased from 19 to 33, 10 of which were filed by Japanese companies.

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CSO: 3698/349

MICROELECTRONICS

EEC 'MICROELECTRONICS PLAN' AIMED AT SEMICONDUCTOR INDUSTRY

Paris ELECTRONIQUE ACTUALITES in French 16 Mar 84 p 17

[Article by FG]

[Text] The European Microelectronics Plan, different from the recently announced Esprit plan, is now in its operational phase, but it is still too early to judge its first results. Fifteen projects were ultimately retained (eight in the CAD--computer aided design--field, and seven in the area of equipment, processes, and tests); the first seven contracts were signed during the first quarter of 1983, and the eight others only a little over one month ago.

The most advanced projects, and the ones about which we have available information, are the first seven. Among these, six are in the CAD field and one is for a VLSI (very large scale integration) tester.

Among the eight contracts that have just been signed, two are in the CAD field, and six are for machines. Among the latter, one is for a wafer stepper, one for electronic maskers, two for process methods (etching, deposition), and one for testing.

The microelectronics plan, launched in December 1981, stipulated EEC financing for a total of 40 million ECU (European community units) for four years (hence for the 1983-1987 period), with a contribution of 50 percent (30 percent as a general rule) of the execution costs of research and development projects in microelectronics. These projects, which cover lithography (wafer steppers, electronic maskers, X-ray equipment), dry and physical chemical processing of silicon and III-V semiconductors (plasma etch, deposition, and so on), as well as testing and CAD of VLSI integrated circuits, must result in the fabrication of prototypes of equipment to be used by the semiconductor industry.

After the first call for bids issued in April 1982, only eight contracts were ultimately signed, although the Brussels commission had retained ten projects, only one of which concerned equipment. It would appear that the failure in this respect came from the contractors. The Brussels officials are very discreet on the subject.

The seven projects, which have now been studied for the past year, thus cover CAD and testing. The latter is a joint effort on the part of Siemens, Grundig, Italtel, and Efcis (Company for the Study and Fabrication of Special Integrated Circuits) to manufacture a VLSI tester.

Six VLSI CAD projects

Among the six CAD projects, the largest (CVT) involves 28 participants from three countries, and is aimed at a global CAD approach to VLSI integrated circuits for telecommunications. The three major contractors are the PTT research centers of France, Italy, and FRG (CNET--national Center for Telecommunication Studies, CSELT, and FDPP).

The CERES/Cascade (Center for Tests and Research on Special Machines) project, whose participants are Imag/Micado, SGS (Sta Generale Semiconduttori), CTI (Center for Computer Technology), RTC (Radio Technique Compelec), and PTI (Philips Telecommunicatie Industrie), also concerns a global approach to CAD. Its objective is to define design methods and specify aids adapted to VLSI, as well as to develop a prototype multi-level CAD system to demonstrate the feasibility and efficiency of the former.

In turn, SERC/RAL, PTI, GEC, UC Swansea, and TC Dublin, are studying the simulation of three-dimension semiconductors with modeling of transient states and thermal behavior. This study, which involves the development of specific algorithms, should be finished in 1986.

The universities of Louvain and Montpellier, in collaboration with Bell Telephone, PTI, Silvar Lisco, and Siemens, are working to perfect a software system for verifying the performance of VLSI MOS devices throughout their design. Within two years, this study should culminate in the delivery of a prototype system in the form of four software packages and documentation. The fifth project, implemented by STL, GEC, British Telecom, SEL (Standard Elektrik Lorenz Industrie), and LCT (Central Laboratory for Telecommunications), concerns VLSI verification and compilation. The objective is to reduce the time necessary for fabricating a custom VLSI circuit, and to provide the computer tools that will make it possible to simply move from operating specifications, to the system level, and then to implantation into silicon.

The last project is aimed at two and three dimension digital modeling of MOS devices. Its microelectronics objective is to develop programs that will allow the latter. It is implemented by the universities of Cork and Belfast, Analog Devices, and GEC.

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MICROELECTRONICS

BULL, PHILIPS SIGN STANDARDIZATION AGREEMENT

Paris AFP SCIENCES in French 9 Feb 84 p 36

[Text] On February 7 in The Hague, Bull, the number one French data processing company, signed an agreement with Philips to cooperate in the area of the "memory board." According to a joint statement issued by Bull and Philips, the agreement provides for cooperation in this area to ensure the "compatibility of their products and to further the development of international standardization."

The statement emphasized that this agreement is particularly important at a time when the market for the memory board is expanding internationally, particularly in Europe and the United States. The establishment of universal standards, which has been requested by users, is an indispensable condition for the development of this technology. In view of this, Bull and Philips will make joint proposals for the adoption of universal standards at the international standardization proceedings.

The two companies have chosen to adopt jointly the component manufactured by Motorola according to Bull specifications. They have also agreed to exchange the application masks that they have developed and that they will develop on the basis of a reciprocal exchange agreement. The statement concluded that the two companies will maintain their industrial and commercial autonomy as well as their freedom in developing their product lines.

The agreement was signed by Jacques Stern and Casimir Juraszynski, presidents of Bull and Philips France respectively, in the presence of the French Minister of Industry and Research, Laurent Fabius and his Dutch counterpart, Gijs Van Aardenne. Roland Moreno, the French inventor of the memory board, was also present at the ceremony.

Fabius emphasized that the agreement was "an example of what European cooperation could be." "I would like," he added, "for us to have, particularly with Philips, other examples of this type of cooperation." In full agreement with this sentiment, Wisse Dekker, president of Philips Netherlands, who was also present, underlined the fact that this agreement constitutes "the first step towards standardization" in other areas of electronics. "It is, in any case," he stated, "the beginning of electronic currency, 'monetique.'"

In the area of electronic currency the two groups decided to remain independent and competitive, but they adopted the component manufactured by the American firm Motorola from Bull specifications. In order not to be dependent on a single source of supply, the French Eurotechnical group (Thomson Group) will also manufacture a new component designed by Bull.

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CSO: 3698/334

MICROELECTRONICS

FIRST PHASE OF ESPRIT PROGRAM TO STUDY CAD/CAM, VLSI

Paris ELECTRONIQUE ACTUALITES in French 16 Mar 84 p 19

[Article by FG]

[Text] Six projects are now being implemented in advanced microelectronics as part of Esprit's pilot phase. These six projects, which were started last May, should continue for three or four years, and it is therefore too early to assess their first results.

Two of the R&D programs concern VLSI (very large scale integration) interconnection problems. The goal of the pilot phase in this area is to perfect interconnection techniques with several metal layers, compatible with the integration density associated with 1 micron and smaller circuit patterns. These techniques should be implemented as part of the normal production process using high-level CAD (computer-assisted design) procedures.

The first of these projects, which combines the efforts of two Irish companies and research center (National-microelectronique Research CNTR, and Stability Electronics Components) as two major contractors, and two British companies (British Aerospace Dynamics and BPA Ltd), concerns the interconnection of integrated circuits with a large number of contacts. The second project, for VLSI interconnection in general, associates Plessey, GEC, Thomson CSF, and Telefunken Elektronik, as well as three universities, Newcastle and Southampton (Great Britain), and Montpellier. In the VLSI CAD/CAM (computer-aided design and manufacturing) area, the goal of Esprit's pilot phase is to supply the designers of systems based on integrated circuits with basic tools that are powerful, fast, and computer-aided at a high level.

The specific objectives to be attained are:

Establish standards for structured data bases taking into consideration requirements for electrical, symbolic, logical, and graphic functional descriptions;

Create modular software for routing, automatic placement, graphic design, presentation for logic verification, topologic control, simulation, mask fabrication, and cell size reduction;

Formulate accessible design rules and create banks of models;

Create man-machine interfaces to ease the tasks of users, such as direct input of handwritten documents, for instance.

The four projects which are currently being worked on, cover practically all these objectives.

The first, which associates Philips and Siemens, involves the development of a descriptive language for VLSI; and the second, which brings the collaboration of BTMC (Belgium), Efcis, and Universite Catholique de Louvain (Belgium), should lead to the fabrication of a compiler for a parallel signal processor.

A third, which is aimed at the definition of VLSI architecture algorithms for specific signal processing, and the development of placement and routing techniques, is being studied in collaboration by two Belgian universities (Louvain and BTMC), Silvar Lisco, Philips, Siemens, and Ruhr University.

The last is intended to perfect a high-level CAD system for interactive design, placement, and routing. Working on this project are GEC, CII-HB, AEG, and the University of Berlin.

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CSO: 3698/322

MICROELECTRONICS

FRENCH CNET DEVELOPS 'PROTEUS' SINGLE-CHIP MICROPROCESSOR

Paris AFP SCIENCES in French 9 Feb 84 p 37

[Text] A new "chip," a high-performance microprocessor, has just been developed at the Norbert-Segard Center of the National Center for Telecommunications Studies (CNET) in Grenoble, and installed at the Zone for Scientific Experimentation and Research (ZIRST) in Meylan.

This microprocessor, integrated on a single three-micron silicon "chip," has been named "Proteus" and is the product of three years of study by the researchers of CNET as part of the "Components" plan launched in 1977. This complex assembly of signal numerical processing consists of 72,000 transistors with a capacity of 3.3 million multiplications per second as opposed to several hundred thousand in the microprocessors most widely in use now. These kinds of high-yield integrated circuits do exist, however, on the market, but they are primarily manufactured by Japanese (NEC) and American companies (AMI, Texas Instruments). The marketing of Proteus and its companion software will thus permit limiting imports of integrated circuits of this type.

The study of an "architecture" for this type of microprocessor was begun in 1980 at the Norbert-Segard Center in order to remedy a deficiency in the microprocessors available for numerical calculation and thus respond to application demands requiring a calculation capability 10 to 50 times greater than those available.

After a year of research, the circuit architecture was viewed with great interest by potential users when compared with the NEC and Texas Instruments circuits. The production of a prototype with three companies (Sygeca-Logiciel, XCOM and Influx) took two more years. Finally, since December, 1983, CNET has been able to use assistance software for writing programs, and for the first samples of the integrated circuit since the end of January.

The Proteus team is currently carrying out application tests using a modem (modulator-demodulator) for the telephone network with a transmission speed of 4800 bits per second. Negotiations have been opened with a large company specializing in microelectronics for the mass production of Proteus and the first models will be available in the autumn of 1984. The field of application for this integrated circuit is multiple: in telecommunications which is, of course, the primary focus of CNET, but also in microelectronics in general.

But Proteus on its 3 micron chip was hardly born before researchers were studying the possibility of manufacturing microprocessors no larger than 1 micron. The research of the Americans and the Japanese, who have already been working for several years on this "super micro chip," should bring results next year. The researchers of CNET think they will achieve this goal in 1986.

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MICROELECTRONICS

REVIEW OF FINNISH ELECTRONICS INDUSTRY INCLUDES NOKIA, APSO

Paris ELECTRONIQUE ACTUALITES in French 16 Mar 84 pp 1, 24

[Article by H. Pradenc]

[Text] Helsinki--Except for industrial process control, the Finnish electrical and electronic activity sectors show a negative balance in their exchanges with France. During a visit to Finland, we were able to observe that, encouraged by telecommunications and professional electronics, Finnish enterprises have developed products of competitive quality. A number of them, hungry for the French market, are seeking distributors in France.

For an index of 100 in 1980, Finland's electrical and electronic activity had a value of 107 (10.5 billion francs) in 1983, representing an increase of 3 percent over the preceding year. The Federation of Finnish Electrical and Electronic Industries (SETELI) considers this a small growth, due to reduced sales in USSR (largest customer in 1982 with 32 percent of sales) and to weak investments on the part of Finnish industry, which has suffered the consequences of an inflation rate of 9 percent in 1983. France represents 2 percent of the foreign outlets for Finnish electrical and electronic products, while constituting 5 percent of the country's imports in the same sector. This translates into 126 MF (million francs) of exports against 502 MF of imports. In components, the balance rests at 9.75 MF of exports against 67.5 MF of imports and in office equipment at 6 MF against 210 MF. On the other hand, the deficit is lower in consumer goods, where exports are 25.5 MF against 33 MF of imports. In industrial controls the balance is reversed with 30 MF of exports against 18 MF of imports.

Nearly 15 Finnish enterprises are currently represented in France. Others, such as Euroka, which specializes in computer modules, or Metric, which manufactures uninterruptible power supplies, are looking for a French representative.

Salora and Luxor Bought by Nokia

At the beginning of this year, the Finnish group Nokia purchased the Finnish company Salora and the Swedish company Luxor. This operation places Nokia in second position on the Scandinavian electronics market, after LM-Ericsson. Its turnover thus went from 10.5 to 11.6 billion francs, allowing it to reinforce its positions in western Europe and the United States. The activities of the group cover such diverse fields as forestry, rubber, engineering, cables, and electronics, where the 1982 consolidated revenue reached nearly 1.7 billion francs, as well as computers and telecommunications in particular.

Salora contributes its consumer and telematics equipment, which in 1983 represented a revenue approaching 1.1 billion francs. Very few of the television sets which it manufactures at the rate of 250,000 per year are reaching the French market, and its entry into the Nokia group will not bring any changes in this situation. Salora is developing a videotext terminal, the Salora Vistel, as well as pay television systems, and is currently developing a tuner for direct television reception.

Part of Nokia's telecommunications activity (radiotelephone) is carried out by its Mobira subsidiary, which in 1983 achieved sales of more than 322 MF, of which 46 percent in exports. This company supplies the majority of the NMT system mobile telephones, a system which is serving the Scandinavian countries and which now has 70,000 subscribers. More than 55 percent of the world's users of radiotelephones are presently concentrated in northern Europe. Observers forecast 5 million users in 1990, of which 70 percent in the United States and 8 percent in Europe. Officials of the Finnish firm estimate that the latter figure will be higher, notably because of the development of radiotelephones in France and FRG, these two countries being expected to reach the level of development of the nordic countries in 1985.

Micronas, a Nokia subsidiary specialized in VLSI circuits, devotes 70 percent of its activity to telecommunications, and 30 percent to robotics and measurement instruments. In particular, the role of this enterprise is to make the Finnish telephone industry independent in terms of integrated circuits. A young expanding company, Micronas produces gate arrays, circuits with logical and linear portions, as well as custom circuits.

Another group with diversified activities, Aspo represents 1 billion francs of the Finnish industry. In 1983, its electronic sector had a revenue of 120 MF in hybrid circuits and monitoring equipment. France has represented a market of 1.5 MF. About 60 percent of the thick film hybrid circuits are developed for telecommunications. The group's electronic activity is undergoing a present growth of 50 percent. Interested in the French market both for industrial process control and radiotelephones, Aspo is ready for the European standard of 900 MHz.

Also in the telephone field, Laukamo, which in 1983 had a turnover of 105 MF, is developing a one-piece telephone set. Its manufacturer would like to sell it in France, but PTT's barriers are difficult to overcome. Moreover, the company does not intend to display it in windows next to products made in Asia. Laukamo is preparing the second generation of telephones with with a 10-memory and display unit.

In filters, Lauri Kuokkanen is selling its duplexers directly to radio-telephone manufacturers. The company has entered the French market last year. In anticipation of an explosive European market, the company has perfected smaller duplexers, as well as 900 MHz filters corresponding to the European standard.

Evox, a company which fabricates condensers and also sells machines for manufacturing polyester film strips, will diversify its products by starting to make wireless condensers for hybrid circuits, emphasizing its filter activities, and developing an automation and robotics sector (condenser production machines, printed circuit equipment, and food processing equipment).

Automatic Speech Processing

An automatic speech processing system developed by Euroka is currently in operation with 200 customers, where it carries out banking transactions. During this year, the company will distribute its computer modules and its Euro-6 microcomputer in France and FRG.

The electronic display division of the Lohja group has perfected an electroluminescent system with 55 mm-high characters. This system, named Finlux, uses an ultrathin film structure whose license has already been sold to Sintra-Alcatel. Lohja is currently studying a flat screen based on the same principle.

In the case of sensors, Vaisala (200 MF revenue in 1983), whose products are introduced in France by Tekelec, announces a dewpoint probe capable of detecting the SO₂ content in power plant combustion gases. This company has a project for an automatic meteorological station for the Provence-Cote d'Azur freeway.

In the area of uninterruptible power supplies, intended primarily for computers, ICA (Industrial Consulting Agency) is developing a 250 VA unit called the UPS 250 S, which it complements in the 0.5 to 5 KVA range with Merlin-Gerin power supplies.

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MICROELECTRONICS

BRIEFS

NEW FRG MINISTRY POSSIBLE--The FRG is said to be contemplating the creation of a superministry modeled on the French Ministry of Research and Industry or the Japanese Ministry of International Trade and Industry (also in charge of research), because of difficulties in coordinating the activities of the two existing ministries, the BMFT (Research and Technology) and the BWI (Industry and International Trade). In particular, these difficulties have made it necessary to postpone decisions concerning the electronic sector, which were to be made earlier this year. It should be noted that, for the first time, German electronics manufacturers are in favor of the creation of a strategic French-German forum that would prevent duplications and might arrange for a possible distribution of subsectors: one more chance for industrial Europe with a variable geometry. [Text] [Paris LES ECHOS INDUSTRIE in French 28 Mar 84 p 16] 9294

MATRA-DATA-PROCESSING, DATAPOINT AGREEMENT--Next 1 January, subject to approval by boards of directors and authorities, Datapoint will acquire a majority interest in MATRA [Mechanics, Aviation and Traction Company] Data-Processing Division (it will own 80 percent of the stock instead of 49 percent as before, while MATRA will keep 20 percent instead of 51 percent). This transaction will be accompanied by an agreement under which Datapoint equipment--especially, in a first stage, multifunction 8220 terminals--will be manufactured at the MATRA Wintzenheim factory (Alsace). This new product line will "thus optimize utilization of the plant capacity"; the factory already manufactures Tandy microcomputers for Europe, MATRA Micro-System (MMS) products, and products manufactured by the economic interest group MATRA-Hachette and by Axel. According to MATRA Data Processing, the agreement should "enable MATRA to retain a free hand in managing MMS, MATRA-Tandy and MATRA-Hachette, while keeping employment at its present level at the Wintzenheim factory." [Text] [Paris ZERO UN INFORMATIQUE HEBDO in French 2 Jan 84 p 3] 9294

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SCIENTIFIC AND INDUSTRIAL POLICY

CRITERIA FOR QUALIFYING FOR FRG FEDERAL CAD/CAM SUBSIDIES

Munich COMPUTERWOCHE in German 27 Jan 84 p 25

[Article: "CAD/CAM Scene Characterized by Uncertainty"; for related article see JPRS WST-84-002 of this series dated 10 January 1984, pp 97-98]

[Excerpts] The German federal minister of research and technology (BMFT), Heinz Riesenhuber, will supply 530 million marks in support funds for development projects during the next 4 years. With this support a lift will also be given for the first time through significant appropriations to users of CAD/CAM systems. In the following report Klaus Richter, head of the CAM technical program at Scientific Consulting, Cologne, tells us who is going to benefit from this money and what the prerequisites for such benefit are.

Actually, one would expect that a support program characterized by an unbureaucratic bid soliciting procedure, a high level of funding, acceptable support quotas, general utility and entrepreneurial freedom of action while concentrating on new technology previously neglected in the FRG would receive nothing but approval and praise in all quarters. Nevertheless, here, too, there have been grounds for criticism.

First of all, for example, there is the matter of the limited extent of the parties permitted to submit bids. Only a few thousand German enterprises in the manufacturing technology industry benefit by this support measure. But this support is by no means paltry: because anyone who goes about it properly can make it yield a subsidy substantially above 40 percent--and this is quite routine.

Besides, no one should be disheartened on finding that he is not in the circle of authorized bidders. Even after a close examination of the guidelines shows a would-be applicant that the minister of research was probably not thinking of him when he set up the program, he need not go empty-handed away. Because with the help of other funding possibilities most can attain the wished-for 40 percent.

Millions in the CAD/CAM Machinery

And then there are also to be considered the manufacturers of the CAD/CAM systems. Even assuming that there would be "only" about 1,000 firms

supported within the context of the program this would still correspond to a market volume of about 600 million marks for CAD/CAM systems to be newly constructed (hardware and software). In this amount one must also reckon the unavoidably incident consultation costs and development contracts for software. And this is not to mention that a support program which concentrates upon a selected and often ambiguously delimited circle of enterprises necessarily carries along in its wake all competitors or suppliers by obliging them to likewise introduce CAD or CAM.

For this reason the market for CAD/CAM systems in the FRG set in motion by this program will probably be greater by several factors of magnitude than the purely computational 600 million marks.

And this is the ground for further criticism: through the purchase of computers the subsidizing money to a preponderant degree favors American firms who sell their CAD or CAM systems in Germany. Or, to put the matter in extreme terms: about half a billion marks of the German federal tax monies flow out of the subsidizing bag of the BMFT on a straight path into the coffers of the big American computer companies. Can that be considered a logical purpose for a subsidizing program which has set itself the goal of helping primarily small and medium German enterprises in the area of machine construction?

One must certainly assume that in their preliminary studies for this support program the research ministry has also given much thought to this. If, nevertheless, the ministry has decided to embark upon this program then this decision was made with the consciousness that the manufacturing technology industry in the FRG requires immediate aid and moreover any delay while waiting for the strengthening of the German computer and software industry should not be permitted to result in neglect of a traditionally export-oriented branch of industry which is important in the national economy.

Subsidizing More Than Necessary

Over and above all this, the BMFT has closely observed the subsidizing measures to which foreign competitors resort. In the United States, Japan, France and Great Britain there have been subsidy programs, in some cases for a long time, of comparable or greater volume which relate specially to CAD/CAM, flexible manufacturing systems and industrial robot manipulatory systems.

That under these boundary conditions such a subsidy program was more than necessary is also conceded by most critics. The fact that the new program, like the special microelectronics program, was conceived as an indirect-specific support measure is actually only to be welcomed. Anyone who criticizes this either cannot or will not grasp that the procedure of direct project support which was favored in the past has on occasion led to enormous overgrowths of research bureaucracies which exposed the Ministry of Research and Technology to the reproach that it was an institution obstructing technology. This had been known for years to the present federal research minister, as we learn from his speeches and publications.

Freshly entered into office Dr Riesenhuber began to establish new accents in research subsidy policy. Thus, there arose out of the good experience obtained with the "Applications of Microelectronics" program advocated by his predecessor Andreas von Buelow the new program for supporting the use of CAD/CAM.

Those projects which are amenable to support in the manufacturing technology program (CAD/CAM) may be divided into two phases. The first phase which precedes the decision regarding technology procurement (hardware and software) includes system analyses, training of workers, studies of alternatives and feasibility studies as well as the preparation of specification catalogues and performance catalogues. In the second phase there is primarily carried out the procurement of hardware and software and third-party development studies associated with such procurement, such as software modification, adaptation of the system to plant-specific requirements or to the training of workers.

Specific minimum requirements are set up for the CAD/CAM systems to be introduced: a CAD system is defined as a dialogue-oriented data processing system managed by the user which involves the possibility of graphical interactive processing in the functional domains of planning, development and design. The system has at its disposal one or more monitor workplaces, a computer or computer link having at least 16-bit word breadth and is capable of step-by-step expansion because of its modular construction. The user programs to be developed must be written in a higher programming language.

A CAM system in the sense of the guidelines is a dialogue-oriented data processing system managed by the user which involves the possibility of an interactive processing of material at the monitor screen in several functional domains such as production planning, materials control and time control and contract schedule control.

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SCIENTIFIC AND INDUSTRIAL POLICY

BRIEFS

EXPENDITURES OF ANVAR IN FRANCE--In its annual report, Anvar (National Association for the Implementation of Research) announces that it granted innovation support in 1494 instances during 1983, for a total sum of 826 MFF (amounting to 2800 MFF between 1979 and 1983). Thanks to a credit raised to 906 MFF (+9.7 percent) in 1984, and increased by the first repayments, more than one billion francs will be allocated to innovation support in 1984: support for conventional innovation, support for "recourse to services" (intended to encourage enterprises to have recourse to outside counsel, by financing 50 percent of outside expenses between 10 and 150 MFF), and lastly, support for sensitizing the youth to innovation. As for FIM (Industrial Funds for Modernization), created in July 1983 and placed under Anvar's jurisdiction, it should have at its disposal about 8 billion francs for 1983 and 1984 (financed by Codevil savings accounts), and make available technologic participatory loans, or for smaller operations, make it possible to obtain better conditions for leasing companies. [Text] [Paris MINIS ET MICROS in French 30 Jan 84 p 13]

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TECHNOLOGY TRANSFER

FINNISH FIRM WITH USSR TRADE TIES BUYS FRG ROBOTICS FIRM

Helsinki HELSINGIN SANOMAT in Finnish 28 Feb 84 p 28

[Article: "EKE Companies Purchases West German Robot Plant"]

[Text] EKE Companies has purchased majority shares in the West German robot plant GDA. GDA, which operates in Munich, employs 100 people, of whom 25 are involved in research and product development work.

GDA's sales turnover last year was 3 million D-mark, approximately 6 million markkaa. This year it is believed that the firm will exceed a sales turnover of 15 million D-mark.

A new firm called EKE-Automation Company was established in EKE Companies for the purpose of purchasing GDA. The intent is to bring about a merger in which GDA will manufacture industrial robots and EKE-Automation will develop their applications. The cost of applications is frequently the same or even more than the cost of the actual robots.

GDA (Gesellschaft fur Digitale Automatik, GMLH) was established in 1981 by three individuals holding doctorates in engineering. So far the company has brought three different robot models to the production stage. GDA's robots are already being used in the manufacturing plants of Daimler-Benz, Opel, Messerschmidt-Bolkow-Blohm, Renault, and Saab, among others.

GDA's plant in Munich is being directed by its founder, Peter Hagemann. The original owners will continue to control 40 percent of GDA's capital stock. GDA will become a part of EKE-Automation, which is directed by Tarmo Makkonen. EKE owns 51 percent of GDA.

EKE-Automation already intends to begin the construction of offices and other facilities in Kirkkonummi in the summer. The intent is that other industrial and housing facilities will also be built on the 335-hectare lot owned by EKE Companies.

Managing Director Bertel Ekengren of EKE Companies believes that 100--150 million markkaa will be invested in this project. In Finland EKE-Automation will eventually employ approximately 300 people, estimated Tarmo Makkonen.

So far the owners have not yet made a profit from GDA. In fact, the product selection was not put together until last year. It is believed in EKE that a profit will be made in 1985.

"We have been approached by many companies. We need experience in managing extensive projects, and EKE has an excellent reputation in West Germany. We would also like to retain our freedom," stated Hagemann in explaining the background of the transaction. According to him, among the candidates intending to purchase GDA were also the "large mammoths", but in such an instance GDA's independence would have been lost.

GDA presently manufactures approximately 10 robots per month. At the end of last year there were 4,800 industrial robots in use in West Germany.

Involvement in Tallinn Contract Began in 1982 Already

The international operations of EKE Companies began in 1976 when the company was included with West Germans in the gas pipeline project from the Urals to the western border of the USSR. After that, EKE has been involved in several Eastern trade ventures. The company's turnover was 280 million markkaa last year.

Its most recent project is the meat and fruit terminal at the new port of Tallinn. The company wants to refute the impression given by construction circles in the 25 February edition of HELSINGIN SANOMAT that it became involved in the Tallinn port contract only at the last minute.

The company received an invitation to present a bid already in December 1982. The first bid was submitted in January 1983 and a revised offer was made in March 1983, on the basis of which technical negotiations were conducted.

The commercial negotiations on the Tallinn contract began in June 1983. An agreement and technical documents were signed in August 1983 in Moscow, the first among all the competitors.

The company obtained another contract in Tallinn last year. In October Bertel Ekengren signed a delivery contract for the Mistra Carpet Plant.

Another new EKE company, EKE Trading Company, will begin operations in the beginning of March. The company will concentrate on East-West trade. It already has offices in Switzerland and Sweden.

There is a total of five EKE companies. They employ 750 people.

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